

Serial No. 09/386,052

PATENT

Docket No. 1232-4563**REMARKS****Claim Status**

Claims 1-6, 8-17 and 19-27 are pending in this application with claims 1, 8, 9, 19, 20, 23, 24, 25, 26 and 27 being independent in form. Claims 1-6, 8-17 and 19-24 have been allowed and claims 25-27 have been rejected.

Allowed Subject Matter

Applicants gratefully acknowledge the allowance of claims 1-6, 8-17 and 19-24 over the prior art of record.

Rejection of claims 25-27 under 35 U.S.C. § 103(a)

Claims 25-27 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Campbell et al. (GB 2,313,530)("Campbell") in view of Moebius et al. (USP 5,751,907)("Moebius") in further view of Itoh (USP 5,740,320).

While alleging that Campbell teaches or suggests all the remaining elements recited in claims 25-27, the Examiner admits that Campbell fails to teach penalty assigning which sorts phoneme data based upon a prescribed attribute and assigns a penalty on the basis of the sorting order. The Examiner, in modification of Campbell, turns to Moebius for part of the alleged missing teaching of assigning a value to the phoneme data based on a quality measure to rank the phoneme data based on corresponding boundary phonemes. This combination, the Examiner contends, teaches the penalty assigning means assigns the penalty such that a larger penalty is added to the phoneme whose order is near the smallest and biggest and adds a smaller penalty to the phoneme whose order is near the middle. The Examiner, in modification of this combination, turns to Itoh which is alleged to teach comparing the phoneme candidates with an average value of the target phonemes "as suggested by Itoh" such that the selected phonemes will generate natural and smooth synthetic speech, "as taught by Itoh." (See ¶2, pages 2-5 of the Office Action.)

The Examiner's conclusion regarding the above combinations is that each level of modification would have been obvious to one of ordinary skill in the art at the time the invention was made: first, to modify Campbell with the teachings of Moebius and secondly, to further modify the combination of Campbell/Moebius with the teachings of Itoh.

Applicants traverse the stated rejection on several grounds.

First, Applicants again respectfully submit that the combination proffered is not motivated in the prior art.

In forming the stated combination, the Examiner dissects the individual teachings of these references taking elements from each, and first forming a sub-combination which again needs to be modified to allegedly arrive at the claimed invention as recited in claims 25-27. However, the Examiner has not pointed to anything in Campbell (or elsewhere for that matter) that would invite such a dissection and combination of Moebius and/or Itoh in modification of its own teachings.

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Such unmotivated dissection and combination is formed only with the benefit of the present invention as claimed and is clearly improper. Applicants respectfully submit that a *prima facie* case of obviousness has not been set forth and these rejections cannot stand.

Moreover, even *assuming arguendo* such combination were proper, the combination of Campbell with Moebius and/or Itoh does not teach or suggest the claimed invention.

The invention as recited in claim 25 is characterized by, in order to select an appropriate phoneme data from plural items of phoneme data, sorting the items of phoneme data based on a prescribed attribute, and assigning a penalty to each item of the phoneme data on the basis of the order of the sorting so that larger penalty is added to the phoneme whose order is near the smallest and biggest, and smaller penalty is added to the phonemes whose order is near the middle.

As acknowledged by the Examiner, Campbell does not teach penalty assigning which sorts retrieved phoneme data based upon a prescribed attribute value and assigns a penalty value on the basis of the sorting order.

Moebius, Applicants submit, teaches selecting a phonetic sequence by assigning a value to each of the phonetic sequences based on a particular quality measure to rank the phonetic sequence, and specifying the phonetic sequence with the overall best ranking. Moebius does not, however, teach sorting the phonetic sequences and assigning penalty on the basis of the sorting order.

Itoh teaches assigning a penalty to each of the phonemes based on a centroid (average) of attribute values of the phonemes. However, Applicants submit, the present claimed invention is not taught or suggested by the penalty assigning method of Itoh.

Specifically, there are a few phoneme data having outlier data because of reading errors, tagging errors, and so on, in addition to a plurality of phoneme data having a similar value in the actual speech database. It is required that phoneme data as a synthesis unit employed in speech synthesis, have the ability to accommodate the variation which can happen at the time of speech synthesis. This means that distortion is always small in speech synthesis.

For example, assuming that a set of phonemes has attribute values as follows, where each value indicates the attribute value of each phoneme in a database:

"5,1,2,2,3,5,4,4,3,1000,1,1,2,3,4,5"

This set of phonemes includes phonemes having values 1 - 5 and one phoneme having an outlier value.

In the speech synthesizing phase, values 1 - 5 are required and the outlier is never required. Therefore, the value of "3" is the best choice because the modification cost is always small against required range (value 1 - 5). For example, if value '3' is selected from the database and value "1" is required by speech synthesizer, the modification cost is 2 (=3-1). However, if value "5" is selected and value "1" is required, the modification cost is 4 (=5-1).

In such a case, if the method of Itoh is applied, the average value is about "65.5". As a result, if a penalty value is assigned based on the average value, a penalty assigned to a value of "5" is smaller than a penalty assigned to a value "3" because "5" is closer to the average value "65.5" than the value "3" and phoneme data employed as the synthesis unit having

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attribute value "5" will be selected. According to the method of Itoh, the penalty value is affected by the outlier.

To the contrary, according to the present invention as claimed, the above phoneme set is sorted as follows:

"1,1,1,2,2,2,3,3,3,4,4,4,5,5,5,1000"

Because a larger penalty is assigned to the phoneme whose order is near the smallest and biggest and a smaller penalty is assigned to the phoneme whose order is near the middle, a penalty assigned to the value of "3" is smaller than a penalty assigned to value "5". As a result, phoneme data employed in synthesis of a speech waveform having an attribute value "3" will be selected. It is thus preferable, as occurs in the claimed invention, to eliminate the influence of the outlier.

As argued above, the penalty assigning means of the claimed invention has the desirable effect where the influence of an outlier can be eliminated.

As such, the invention as recited in claim 25 is believed patentable over Campbell, Moebius and Itoh because neither Campbell, Moebius nor Itoh taken alone or in combination, teach, disclose or suggest all of the limitations of claim 25.

As claims 26 and 27 are method and computer medium claims which correspond to apparatus claim 25, claims 26 and 27 are believed allowable for at least similar reasons as claim 25.

Claims 25-27 are therefore believed not anticipated by nor rendered obvious in view of Campbell, Moebius or Itoh, taken individually or in combination. Accordingly, claims 25-27 have not been amended and are believed to be allowable as they stand on the record. Applicants respectfully request the reconsideration and withdrawal of the rejection of claims 25-27 under 35 U.S.C. § 103(a).

CONCLUSION

In view of the foregoing, Applicants believe that all pending claims are hereby rendered allowable over the art of record taken alone or in combination and further submit that the application is thus placed in condition for allowance which action is earnestly requested.

While no fees or extensions of time are believed necessary for this paper, should an extension of time be required to render the filing of this paper timely, such extension is hereby petitioned and the Commissioner is hereby authorized to charge any additional fees which may be required for the timely consideration of this amendment, or credit any overpayment, to Deposit Account No. 13-4500, Order No. 1232-4563.

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In the event that a telephone conference would facilitate prosecution of the instant application in any way, the Examiner is invited to contact the undersigned at the number provided.

Respectfully submitted,

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Dated: October 19, 2004

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